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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/605,671
Filing Date: October 16, 2003
Appellant(s): MARUGAN ET AL.

Marina Larson (Registration No. 32083)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 8, 2008 appealing from the Office action mailed January 18, 2008

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,451,632	Okamura et al.	09/1995
5,804,654	Lo et al.	09/1998
2002/0019466	Falcone et al.	02/2002
4,357,170	Brand et al.	11/1982
3,542,575	Nelson	11/1970

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 72-78, 80, 83-88, 91-97, 100, 102-107, and 110-112, 114-116, 118-124, and 127-130, and 132 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamura et al., (U.S. 5,451,632).

Okumura discloses the preparation of a polycarbonate-polysiloxane copolymer and its combination with one or more of several materials to form a composition including an admixture of said copolymer and polycarbonate homopolymer, an admixture of said copolymer and a high impact styrenic resin (column 13), an admixture of said copolymer and a fluororesin, an admixture of said copolymer and a pigment, etc. (column 9, lines 5-10). For instance, columns 9 and 10 teach a blend of the copolymer and polycarbonate homopolymer wherein 0.1 to 99.9 wt.% of the former are added to 99.9 to 0.1% of the latter. Column 12, lines 40-68 through column 13, lines 1-6 disclose

mixtures of the copolymer and a pigment of which titanium dioxide is preferred, wherein the pigment comprises preferably between 0.1 and 10% by weight of the total.

Relevant to the present discussion, the disclosure (column 15, lines 40-44) also provides for mixtures of the copolymer and any of the other embodiments of component (B) set forth therein (where component (B) is the materials delineated *supra*). Also germane to the Examiner's assertion of unpatentability, the reference repeatedly emphasizes the importance of having a specified content of the polydiorganosiloxane as a weight percentage of the entire composition. For instance, where the copolymer is combined with polycarbonate homopolymer, column 10, lines 44-56 state that the siloxane portion should comprise between 0.02 to 8 percent by weight of the total. See also column 12, lines 36-39 and column 14, lines 53-57 where minimum amounts are prescribed for each of the different combinations of copolymer and component (B).

Concerning Applicant's stipulation that the siloxane content should be at least 3% by weight, column 10, lines 49-56 state that mechanical properties and flame resistance are compromised when one deviates from this quantity as a percentage of the composition which, in one embodiment suggested by the reference, may comprise all of the materials outlined in the claims.

Concerning independent claim 102, the first thickness recited therein is arbitrary and can be any thickness whatsoever. Table 2C summarizes the physical attributes of sheets of 1/16" (approximately 1.6 mm) and 1/32" thickness that are made from compositions exemplary of the invention. Most of these demonstrate a flame resistance

of V-0 hence the article of claim 102 is rendered obvious for any first thickness below 1/16".

The reference provides for an embodiment wherein the pigment is treated with a silicone oil for the purpose of enhancing dispersibility (column 12, lines 57-59). Accordingly, claims 86-87 and 105-106 are, likewise, rejected.

As an aside, the Examiner remarked in his appeal brief that claims 119-132 were, "directed to allowable subject matter and [were] not to be reviewed upon appeal." This ostensibly was based on the rationale set out in the Examiner's October 5, 2005 correspondence. It is noted, however, that the reference never actually expressly states that treatment of the pigment is accomplished *in situ*. Rather, column 12, lines 57-59 say only that silicone oils "may be used" to enhance dispersion, there being no indication as to whether the oil and pigment are combined prior to adding the pigment to the polycarbonate-polysiloxane copolymer. Further, even if it were only appropriate to infer from that passage that treatment is performed in situ, a notion that the Examiner is not in agreement with, the courts have ruled that changing the sequence of steps of a process (in this case, to treat the pigment with a silicone oil prior to its addition to the polysiloxane polycarbonate copolymer instead of after pigment and copolymer have been combined) is obvious in the absence of any evidence that the product is somehow changed by the change in sequence of steps. Accordingly, claim 119 and various claims dependent therefrom are not allowable over the prior art.

Concerning the claims directed to the introduction of an impact modifier, it is now recognized that a separate motivation to add this component was not necessary

inasmuch as (i) the reference already contemplates combinations of the polysiloxane-polycarbonate copolymer with more than one embodiment of component (B), and one permutation of (B) is high impact styrene of which SBS rubber is exemplary.

As for claim 78, the incorporation of fibril-forming tetrafluoroethylene is contemplated in column 14, lines 58-68 through column 15, lines 1-28.

As for claims 80, 83-85, 88, 91-93, 107, 110-112, 124, and 127-129, auxillary flame retardants such as alkali metal salts of perfluorinated sulfonic acids and including potassium salt of perfluorobutanesulfonic acid are mentioned in column 16, lines 23-55.

Claims 79, 101, and 131 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamura et al., (U.S. 5,451,632) as applied to claims 72-78, 80, 83-88, 91-93, 100-107, and 110-112, 114-116, 118-124, and 127-129, and 132 above, and further in view of Lo et al., (5,804,654) and/or Falcone et al., (U.S. Patent Application Publication No. 2002/0019466).

Okamura mentions the incorporation of fibril-forming PTFE, a known antidrip agent, in columns 14 and 15 but is silent regarding the incorporation of PTFE encapsulated in styrene-acrylonitrile copolymer.

There are documents numbering in the hundreds that contemplate using polytetrafluorethylene (PTFE) as an anti-drip agent. However, it is documented in Lo et al. and elsewhere that PTFE aggregates when blended into polycarbonate matrices thereby having a deleterious effect on the mechanical properties of the polymer. (The

aggregates are actually referred to in *Lo* as "networks" in column 1, line 24.) To address this matter, Lo teaches the preparation of styrene-acrylonitrile-encapsulated PTFE (column 4, lines 20-22) that acquires the form of a free flowing polymer that, when blended into a thermoplastic, does not adversely affect the mechanical properties and, further, even provides an enhancement in flame-resistance (column 1, lines 32-39). Falcone (Example 1) indicates that the incorporation of these copolymers as anti-dip agents is now conventional. Accordingly, this aspect of the invention is obvious.

Claims 94-96, 98-99, 113-115, and 117-118 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamura et al., (U.S. 5,451,632) as applied to claims 72-78, 80, 83-88, 91-93, 100-107, and 110-112, 114-116, 118-124, and 127-129, and 132 above in view of Brand, (U.S. 4,357,170) and/or Nelson et al., (U.S. 3,542,575).

In column 12, line 58, Okamura contemplates using polyol as a dispersing aid for titanium oxide but does not volunteer any examples of the polyol. Nevertheless, it is well-established that trimethylolpropane is exemplary of the polyols employed for this purpose as is illustrated by its mention in Brand (claim 11), Nelson (column 4, lines 29-34), and others.

(10) Response to Argument

Applicants traverse the Examiner's rejection of the aforementioned claims employing various arguments. These will be addressed in the order presented in their brief.

Applicants first dispute the premise that Okumura reasonably suggests at all a three component composition, let alone one that adheres to the weight fraction limitations set out in the claims.

The Examiner believes, in fact, that there is fair suggestion of three-component compositions in a couple of sections of the Okamura document. At the outset, it should be pointed out that Okamura requires the polycarbonate-polysiloxane copolymer, labeled component (A) and denoted in shorthand notation in the reference as PC-PDMS, as an essential component. Columns 9-15 delineate different permutations of the component (B) with an indication in column 15, lines 40-44 that (A) may be used in concert with one or more of the various permutations of (B) of which there are about six general categories (polycarbonate homopolymer, filler, fluororesin, pigment, high impact polystyrene, and fibril-forming PTFE). Applicant places particular emphasis in their brief on the fact that, in the above-mentioned passage, the conjunction “or” is used which Applicant contends means that the different permutations of component (B) are only to be used in the alternative. The Examiner does not believe that “or” necessarily means in this case that only a single embodiment of (B) can be used. Rather, it is eminently reasonable to suppose that the author of this publication had employed “or” in lieu of “and” merely to avoid suggesting that all of said resin, inorganic filler, and pigment must

be used together. Indeed, column 11, lines 56-59 indicate that an inorganic filler and polycarbonate homopolymer may simultaneously be blended with the polycarbonate-polysiloxane copolymer. See also claim 3 of the reference. This teaching in combination with that at column 15, lines 40-44 would reasonably lead one to the deduction that various combinations of the different embodiments of (B) may be formulated together with (A).

Further, there are a finite number of three-component compositions that may be realized by combining the different categories of material identified *supra*. Of the pigments mentioned, of which there are only several, titanium dioxide is clearly favored (column 12, lines 47-48). Moreover, any of the polymers embraced by polycarbonate homopolymer would "read on" the polycarbonate resin recited by the claims. These facts taken together lead the Examiner to conclude that at least the combination of materials outlined in claim 1 is rendered obvious by *Okamura*. That the reference does not expressly disclose this combination of materials either in the body of the description or in the Examples is the reason why the claims have been rejected under 35 U.S.C. 103 instead of 35 U.S.C. 102.

As for the weight contributions stipulated in each of claim 72, 104, and 106, Okamura contemplates using 0.1 to 10 weight percent of the pigment in column 12, lines 66-67. The Examiner believes that this disclosure suggests Applicants recited range for the parameter with sufficient specificity. Concerning the weight contribution of the polysiloxane portion of the polycarbonate-polysiloxane copolymer, column 10, lines 40-55 clearly state that the polysiloxane content as a fraction of the total should be 0.01

to 10 weight percent. Again, the Examiner believes that the range required, at at least 3% by weight, is at least obvious if not taught with sufficient specificity so as to merit an anticipation (there being, after all, overlap over better than 50% of the range taught by the reference.) Subsequently, the reference instructs that mechanical strength, flame resistance, and heat resistance are all deleteriously affected if the amount of siloxane content as a fraction of the total weight of the composition, *which may include other materials*, is outside of the range advocated. Clearly, the skilled artisan will appreciate that the siloxane content is not to deviate from that amount disclosed in column 10, lines 40-55, which overlaps significantly with the amount claimed.

Applicant next contends that, insofar as they have identified an unexpected problem (i.e. that blends of polycarbonate, polycarbonate-polysiloxane copolymer, and titanium dioxide exhibit poor flame retardance whereas mixtures of any two of these demonstrates comparatively superior flame retardance), it necessarily follows that a solution to that problem is, itself, unexpected. While the Examiner acknowledges that the aforementioned problem is perhaps unexpected in light of the evidence of record-Okamura, for instance, does reflect that different binary mixtures of polycarbonate/polycarbonate-siloxane copolymer and polycarbonate-siloxane copolymer/titanium dioxide possess good flame retardance, he respectfully disagrees that any solution to that problem is, itself, unexpected. In the Examiner's January 18, 2008 correspondence, a hypothetical situation was created to illustrate this point:

"Consider the hypothetical scenario wherein a novel polymer is prepared with an eye to using it in applications that require the polymer to possess good impact resistance. However, despite the expectations that this polymer would possess good impact resistance based on its structural attributes, mechanical tests indicate that the polymer is, instead, somewhat brittle. This is an unexpected *problem*. Consider then that the inventor proposes to resolve this matter by adding one of many known core-shell polymers having a well-documented effect of improving impact resistance. This is a solution that, although being applied to an unexpected problem is not, itself, unexpected."

The Examiner admits, on the other hand, that the solution presently offered to the unexpected problem of reduced flame retardance when all of a polycarbonate homopolymer, polycarbonate-polysiloxane copolymer and titanium dioxide are combined, i.e. (a) the incorporation of polycarbonate-polysiloxane in amounts that provide a specified minimum quantity of siloxane content, and (b) the addition of titanium dioxide only in certain amounts and wherein the surface of this additive has been coated with an organic treating agent, is not such a clearly-obvious solution. However, the obstacles to patentability are still considerable and have not been adequately addressed in the Examiner's estimation.

To demonstrate that the solution conceived by Applicants is unexpected, they must show that the parameters on which they rely are unequivocally critical to an expectation of success when practicing their invention. If the Applicants are to rely on the particular limitations of the claims and their criticality to successfully practice the

invention as a means of overcoming the prior art, such an illustration would have to include (i), (ii), and (iii) as these are the parameters that Applicant has identified as being especially important on page 4 of their November 29, 2007 response:

> (i) a clear demonstration that a desired level of flame retardance, ostensibly characterized by a p(FTP) at 1.6 mm of greater than 0.9, is only realized if the titanium dioxide is treated with an organic coating *even when all other aspects of the claimed invention are satisfied.* (That is to say, Applicants have indicated that coating the titanium dioxide is a critical element and, therefore, a measurement of the flame retardance in a composition containing a polycarbonate homopolymer, a polycarbonate-polysiloxane copolymer added in a quantity corresponding to that needed to provide at least 3 wt.% siloxane, and 1-2.5 wt.% of untreated titanium dioxide should yield a p(FTP) at 1.6 mm of considerably lower than 0.9.)
>
> (ii) a clear demonstration that, when the amount of titanium dioxide is less than 1 wt.%, or higher than 2.5 wt.%, the flame retardance as measured by the p(FTP) at 1.6 mm test is dramatically lowered.
>
> (iii) a clear demonstration that, when the amount of siloxane contributed by the polycarbonate-polysiloxane copolymer is less than 3 wt.%, the flame retardance as measured by the p(FTP) at 1.6 mm test is dramatically lowered.

Applicant has not met their burden in the Examiner's view. Indeed, there appear to be no comparisons verifying that coating the TiO_2 is at all critical to the successful

implementation of the invention. There are, for example, no comparisons offered between two compositions that are identically-constituted except for the fact that the titanium dioxide surface has not been organically-modified in one of them. Additionally, while it is noted that each of the trials summarized in Table 3 employed a composition where the siloxane contribution at .12(0.2)(100) = 2.4% is lower than the 3 wt.% mandated by the claims, it is not clear that the unfavorable results are attributed to this fact alone, the fact that the titanium dioxide fraction is untreated (a possibility that cannot be corroborated), or both.

Applicant suggests that the Examiner is overreaching in asking them to make the showings mentioned *supra*. From page 9 of their brief:

> The Examiner places undue weight on requiring Applicants to demonstrate the criticality of the individual limitations of the claims in isolation and to amend the claims to include reference to the enhanced unexpected properties.

Continuing on page 9:

> … it is not the case that any one individual limitation is by itself critical to the resulting properties of the blend in the absence of all other limitations. Instead, what the present claims require and the disclosure provides are specific combinations of three components that when present in the claimed amounts have a resulting enhanced effect on the flame performance at a certain thickness of an article made from the composition. In other words the limitations relating to siloxane content, the organic coating of the TiO2, the minimum wall thickness, and the polycarbonate, among others, cannot and should not be considered in isolation without the balance of limitations of the specifically considered claim. *See* paragraph 53 on page 12 of the present specification.

However, the Examiner submits that, if it is Applicant's intent to challenge the validity of his rejection on the basis that the respective quantities of the siloxane and titanium dioxide are unexpectedly critical to obtaining the alleged unexpected result, they must be willing to provide evidence that unequivocally illustrates the criticality of the ranges

as defined. Further, said evidence should be commensurate in scope with what is being claimed and should include documentation of the effects of treating the pigment (although the reference clearly anticipates this limitation). The trials in Applicant's Specification simply fail to accomplish this objective and, in fact, it is to be emphasized that, in at least trial 18 (Table 5), it would appear that all of the limitations of the claims are satisfied yet an undesirable outcome, i.e. an p(FTP) @ 1.6 mm of 0.675 is reported.

As an aside, observations concerning the seemingly contradictory result in trial 18 were made earlier in this prosecution and the Applicant had responded by saying that this entry merely illustrates that, where that composition is used in the manufacture of an article, it should have a minimum thickness greater than 1.6 mm. Applicant also remarks that it had not been their intention to imply that a p(FTP) of at least 0.9 is required. While this may be true, Applicant must be able to point to an outcome that they regard as being exemplary if the Examiner is to be able to interpret the data and determine what has, and has not, been established as a critical element of the invention. (It shall be noted that Applicants themselves had seemed to regard the p(FTP) measurement as the best reflection of the viability of the composition. For instance, entry 2 in Table 3 reports an p(FTP) of 0.72, which is higher than that of entry 18 yet it is indicated that this composition is not representative of their invention. Obviously, there is a disconnect somewhere in Applicant's arguments.)

Concerning claims 73 and 103, it Applicant's position that this limitation cannot be satisfied by the teachings of the reference while still realizing a composition having the required polysiloxane content:

The PC-siloxane copolymer, used as a starting material for mixing with PC in the example section of Okumura, with the highest amount of siloxane is in example 2A (i.e. 3.8% PDMS). If this PC-siloxane copolymer were used in a composition containing 50% bulk resin and 50% copolymer, the amount of siloxane would be 1.9% which is outside the scope of the present claims.

Applicant is conveniently relying on select Examples taught by the reference to bolster their contention that the minimum siloxane content disclosed in claim 1 is not contemplated. However, in doing so, they ignore the broader teaching in column 10, lines 40-49 where it is stated that the siloxane content as a fraction of the total weight is 0.01 to 10 wt.%. "Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments." *In re Susi,* 440 F.2d 442, 169 USPQ 423 (CCPA 1971). A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including nonpreferred embodiments. *Merck & Co. v. Biocraft Laboratones,* 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), *cert. denied,* 493 U.S. 975 (1989). Moreover, the skilled artisan would appreciate that, where circumstances dictated the use of more polycarbonate homopolymer, judicious selection of a copolymer that maintains the polysiloxane content within the disclosed range would be necessary.

As for Applicant's article claims, it is first noted that the Examiner had labeled.the claimed first thickness as arbitrary because Applicant had not defined said thickness in specific numerical terms and, hence, the first thickness could be of any dimension from a few micrometers to a few inches or more. Concerning Applicant's V-0 limitation, this limitation is inherently satisfied since the reference suggests an equivalent composition and the first thickness is undefined. That is to say, although a composition containing

the claimed components and wherein the siloxane content is 3 wt.% will not necessarily provide a V-O rating at one first thickness, there is surely another first thickness embraced by the claims at which this rating is met. On the other hand, because claim 104 defines a specific first thickness, the V-0 rating limitation cannot be said to be inherently satisfied. (See Applicant's rebuttal of the Examiner's remarks concerning trial 18 of the Specification on page 4 of their November 20, 2006 brief.) Nevertheless, the reference indicates that flame retardance is impacted by the presence/absence of polysiloxane content (column 10, lines 40-55) and the skilled artisan would certainly aspire to achieve a V-0 rating where possible. Accordingly, one of ordinary skill would vary either (i) the amount of polysiloxane content in the copolymer or (ii) the amount of the copolymer itself added to the composition, or both, as a matter of routine experimentation to identify that quantity of the copolymer that is necessary to obtain an article with a V-0 rating at 1.6 mm thickness.

Of the *Lo* and *Falcone* references Applicant says only that they fail to address the perceived deficiencies of *Okamura.* Applicant does not comment on the rejections stated over *Okamura* in view of *Brand* and/or *Nelson.*

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Marc S. Zimmer/

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